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ABSTRACT

This document contains four papers from a symposium on performance, productivity, and continuous improvement. "Investigating the Association between Productivity and Quality Performance in Two Manufacturing Settings" (Constantine Kontoghiorghes, Robert Gudgel) summarizes a study that identified the following quality management variables as the strongest predictors of productivity and performance: internal process satisfaction; external customer satisfaction; and consistent delivery of work output in a complete fashion. "Tri-Dimensional Social Support from Supervisor and Multilevel Performance in Government Units in Thailand" (Duchduen Bhanthumnavin) reports on a study of 355 supervisor-subordinate pairs working in health centers in Thailand. "Continuous Improvement through TQM (Total Quality Management) A Case Study in Rhetoric" (John Stuart Walton, Prabhjot Kaur Basra) discusses the relationship between TQM, organization- wide change initiatives, and continuous improvement at large organizations in the United Kingdom over a 15-year period. "An Analysis of Factors Associated with Research Productivity of Human Resource Development Faculty" (Heather A. Williams, James E. Bartlett III, Joe W. Kotrlik, Chadwick Higgins) reports on a study of the research productivity of HRD faculty that identified the following five variables as accounting for 50% of the variance in the faculty members' research productivity: teaching; research; service; administrative allocation; and amount of graduate assistant hours. All four papers contain substantial bibliographies. (MN)

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# 2002 AHRD Conference

# Performance, Productivity and Continuous Improvement

## Symposium 42

Honolulu, Hawaii

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# Investigating the Association Between Productivity and Quality Performance in Two Manufacturing Settings

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***The main purpose of this study was to examine the relationship between productivity and quality performance in two manufacturing settings. In all, the results of this study have ascertained the close association between quality and productivity performance and suggested that investments in quality should indeed result in productivity gains. The quality management variables that were found to be the strongest predictors of productivity performance were those pertaining to internal process satisfaction, external customer satisfaction, and consistent delivery of work output in a complete fashion.***

Keywords: Productivity, Quality, Performance

As highlighted by ASTD's "Human Resource Wheel" (McLagan, 1989), the ultimate desired outcome of HRD interventions is improvements in productivity, quality, innovation, human resource fulfillment, or readiness for change. It is also widely known that in today's very competitive and customer driven markets both productivity and quality have become a very important strategic priority for most organizations. Yet, despite their importance, HRD research in the area of productivity and quality performance has been almost non-existent. The main purpose of this empirical study is to address this limitation of HRD research and thus examine the relationship between productivity and quality performance in two manufacturing organizations.

Perhaps the lack of research in the productivity and quality improvement area can be attributed to the conflicting points of view pertaining to the compatibility of the productivity and quality improvement approaches. Manufacturing managers in the U.S. and Western Europe have traditionally argued that improvements in product quality are costly and do not result in commensurate improvements in productivity (Womack, Jones, & Roos, 1990; Mohanty, 1998). This belief has been challenged since the mid twentieth century by quality experts who have suggested that improvements in quality also result in productivity increases. One of the earliest experts to suggest a link between productivity and quality was Feigenbaum (1961) who stated that "productivity is increased by emphasizing the positive control of quality rather than after -the- fact detection and rework of failures" (p. 20). Deming (1982, 1986) argued that improvements in quality do create corresponding improvements in productivity by reducing costs, errors, rework, and delays. Feigenbaum (1961) indicated that "with the balanced manufacturing capability for quality production in place, productivity rises as costs per unit decrease" (p. 20).

Quality has been described as satisfying customers (Spencer,1994), conformance of a product to established standards (Crosby, 1979, Garvin, 1984, Lindsay & Petrick, 1997), and desired characteristics and value of a product as defined by the customer (Womack and Jones, 1996). Womack and Jones (1996) further suggest that "value can only be defined by the ultimate customer and it is only meaningful when expressed in terms of a specific product (a good or a service, and often both at once) which meets the customer's needs at a specific price at a specific time" (p. 16). Quality of services has been described as timeliness of providing services when requested by customers, completeness of services provided, courtesy to customers, consistent service quality and responsiveness to customer needs (Lindsay & Petrick, 1997). Finally, Japanese quality expert Masaaki Imai (1986) suggested that "in its broadest sense, quality is anything that can be improved" (p. 9).

Productivity is commonly defined in terms of output to input ratios (Sumanth, 1981a, 1981b), the number of processes a worker can handle during the time necessary for producing one unit (Monden,1993), or simply as efficient use of production resources (Monden, 1993; Womack & Jones, 1996). Productivity has also been described by various performance measures such as machine utilization, schedule performance, and cost variances (Huge, 1990). Another description of productivity is output divided by an organization's total headcount (Huge, 1990). By any of these definitions, productivity is viewed as an outcome which is measured against resources expended to create that outcome.

Organizations that have succeeded in improving productivity and quality have typically used approaches such as total quality management (TQM), continuous improvement (also called kaizen), or lean manufacturing principles (also called the Toyota production system). TQM has been defined as a customer focused strategy involving all employees in continuous improvement of processes, products, and services (Herron, Bohan, & Meyer, 1997). TQM

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has also been described as "a group of methods and techniques for enhancing competitive performance by improving the quality of products and services (Grant, Shani, & Krisn, 1994, p. 26). Relative to service industries, the TQM concept has been called total quality service (TQS) and defined as "a true commitment to operationalizing the concept of customer focus, establishing service performance standards, measuring performance against benchmarks, recognizing and rewarding exemplary behavior so as to increase sales and market share" (Stamatis, 1996, p. 43).

Relative to creating and maintaining effective work areas, a process called 5 S's has been used as part of lean manufacturing practices (Monden, 1993). 5 S principles require employees within their work areas to eliminate unnecessary equipment and clutter (sort), organize work areas for ease of using tools and equipment (set in place), maintain cleanliness of work areas (shine), use standard procedures and visual aids to process work (standardize), and comply with the first four S's (Sustain). Womack and Jones (1996) suggest that use of 5 S principles is an important step towards creating and maintaining work areas which promote better quality and productivity.

Related to TQM and lean manufacturing are the concepts of Kaizen or Continuous Improvement (Monden, Shibakawa, Takayanagi, & Nagao, 1985; Imai, 1986). Kaizen means continuous incremental improvement of quality and productivity processes to help meet organizational goals (Imai, 1986). Kaizen also means using employee ideas and participation to accomplish these quality and productivity improvements (Imai, 1986).

In all, the concepts of TQM, lean manufacturing, and kaizen seem to incorporate many common characteristics that help organizations improve quality and productivity. These common elements can be summarized as process improvement, employee involvement, reduction of waste, performance measurement, benchmarking against competitors and the best organizations, focus on customer needs, control of product and service quality, control of costs, a learning culture, and mutual help to provide quality inputs in a timely manner.

A five year worldwide study of the automotive industry by Massachusetts Institute of Technology revealed that certain assembly plants had concurrently achieved high quality and high productivity (Womack et al., 1990). These plants were managed using lean manufacturing (Womack et al., 1990) or the Toyota production system (Monden, 1993). Lean manufacturing is characterized by prevention of errors and defects, simple and synchronized manufacturing processes, speed in changing from production of one product to another, and a major focus on elimination of various forms of waste such as unneeded inventory and unnecessary movement of products. Lean Manufacturing includes employee control of quality decisions, employee involvement to improve processes, error-proofing of work output, and use of 5S principles. (Womack et al., 1990; Monden, 1993).

A case study by Gudgel and Feitler (2000) documented a quality management intervention in a manufacturing firm that resulted in concurrent improvements of 57% in quality and 81% in productivity. A single quality management intervention was able to produce a dramatic and simultaneous improve in both quality and productivity. The documentation of these improvements support Deming's concept of better quality resulting in better productivity and the link between quality and productivity variables proposed in this study.

An empirical study by Kontoghiorghes and Bryant (2001) examined the link between quality and productivity in a service non-profit organization in the health care insurance industry. Positive and strong correlations were found between the investigated quality and productivity indicators. The Kontoghiorghes and Bryant study further identified the quality indicator "work output by peers is consistently delivered in a complete fashion" to be the strongest predictor of two of the three productivity indicators investigated (work output by peers exceeds expectations; inputs from peers are received in a timely fashion). This study also found satisfaction with internal processes, to be the strongest predictor of the productivity indicator of "cost effective production". Other quality indicators and variables that were found to be strong predictors of the investigated productivity indicators were: satisfaction with quality of peer work output; emphasis on doing things right the first time; measurement of product or service quality at every step of the process; organization focus on process improvement; and, decision making involvement. In all, the results of this study highlighted the close association between quality and productivity performance in a service environment and suggested that investments in quality should indeed result in productivity gains.

Despite some anecdotal evidence that suggests a strong association between quality and productivity performance, still many today consider the two as antithetical approaches. As Deming (1986) put it, "folklore has it in America that quality and production are incompatible: that you can not have both. A plant manager will tell you that it is either or. In his experience, if he pushes quality, he falls behind in production. If he pushes production, his quality suffers" (p. 1). According to Mohanty (1998), however, "it is productivity (value addition) and quality (value enhancement) that determine competitiveness. To remain competitive, organizations need to integrate and synergize both productivity and quality" (p. 759). Despite the need to integrate and synthesize the quality and productivity approaches, very little empirical research has been conducted to examine the commonality between the two (Mohanty, 1998).

**Purpose of the Study**

As it was stated in the introduction, the main purpose of this study was to examine the relationship between productivity and quality performance in two manufacturing organizations. In doing so, the relationship between distinct quality and productivity indicators was assessed and described. Further, this study attempted to identify and describe organizational variables that are commonly important for quality and productivity performance. Lastly, this study attempted to determine the extent to which the findings of the Kontoghiorghes and Bryant (2001) study in a service non-profit organization could be validated in a manufacturing setting as well.

The organizational dimensions that were assessed in this study were: continuous improvement practices, quality management, the learning culture of the organization, management practices, employee involvement, organizational structure, reward systems, job design, innovation practices, technology management, knowledge management, and teamwork. The quality indicators considered in this study were: external customer satisfaction; customer loyalty, satisfaction with quality of work output by peers; work output by peers is consistently delivered accurately; internal process satisfaction; the extent to which all products or services produced meet established specifications; on-time delivery of products or services; the extent to which employees react quickly to resolve unexpected problems; the extent to which no further changes or rework is needed after the final products or services are produced; and, the extent to which no scrap is produced.

Productivity in this study was measured in terms of the following indicators: the extent to which the amount of work output by peers exceeds expectations; the extent to which products or services are produced in a cost effective manner; and, the extent to which inputs are received from others in a timely fashion.

**Research Questions**

The main research questions for this study were:

1. What is the relationship between the identified productivity and quality indicators?
2. Which of the quality management variables incorporated in the study can also serve as predictors for productivity performance?
3. To what extent do the results of this study, which was conducted in the manufacturing domain, validate those of the Kontoghiorghes and Bryant study, which was conducted in a service non-profit organization?

*Methodology*

*Instrument.* The instrument of this study consisted of a 108 Likert item questionnaire, which was designed to assess the organization in terms of the earlier described dimensions and indicators. Many of the dimensions and indicators were assessed with scales that were used or described in previous literature or research (Buckingham & Coffman; 1999; Hackman & Oldham, 1980; Kontoghiorghes, 2001a; Kontoghiorghes, 2001b; Kontoghiorghes & Dembeck, 2001; Lindsay & Petrick, 1997; Macy & Izumi, 1993; Pasmore, 1988; Whitney & Pavett, 1998), while several were custom-designed specifically for this and other studies. In all, the questionnaire attempts to determine the extent to which the organization is functioning as a high performance system and according to TQM and sociotechnical systems theory principles. Further, the instrument assesses the extent to which the organizational environment is conducive to training transfer and a continuous learning culture.

The instrument utilized a six-point scale that ranged from "strongly disagree" to "strongly agree". The first version of the questionnaire, which consisted of 99 Likert items, was originally pilot-tested on a group of 15 participants for clarity. Furthermore, a group of seven experts in the organization development, human resource development, or quality management areas reviewed the instrument for content validity. Upon revision, the instrument was then administered to a group of 323 members of five different organizations. Reliability tests were conducted and the instrument was further refined and expanded. As stated earlier, in its final format the instrument consisted of 108 Likert items. The reliability of the instrument was measured in terms of coefficient alpha and was found to be 0.98.

*Subjects.* The sampling frame of this study consisted of 179 employees of a manufacturing facility in Texas and 60 employees of manufacturing facility of a different organization in Michigan. Both facilities manufactured products used in the auto industry. The surveys were administered internally by an Organization Development manager in the Texas facility and a Human Resource manager in Michigan. The surveys were given to all members of both facilities. In all, 134 of the employees of the Texas facility (74.8%) and 55 of the Michigan one (91.6%) returned the surveys. Collectively, 189 of the possible 239 participants returned the surveys and thus the overall response rate is calculated at 79.08%. In short, 81.1% of all respondents were hourly employees, 1.8%



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administrative personnel, 7.7% salaried professional, 4.7% supervisors, 4.1% middle management, and 0.6% senior management. 75.9% of all respondents were male and 24.1% female. In terms of education, 64.3% of the respondents had a high school degree, 19.1% an associates, 7.6% a bachelors, 3.2% a masters, and 1.5% a Ph.D.

*Data Analysis.* The research questions of this study were answered through the use of correlational and regression analyses. In particular, through Pearson correlations the relationship between the identified productivity and quality indicators was described. Further, through stepwise regression analyses the most important quality management variables for productivity performance were identified and described.

**Results and Findings**

*Correlational Analysis.* The Pearson correlations between the productivity and quality indicators are displayed in Table 1. Table 1 further depicts the average correlation of each quality indicator with the respective productivity indicators as well as the average correlation between each productivity indicator and the respective quality ones. As shown, all quality indicators were found to be positively and significantly correlated with every one of the productivity indicators. The correlations ranged from 0.292 to 0.739 and were significant at the 0.01 level. In sum, the correlational data in Table 1 indicates that each productivity indicator exhibited an average correlation of 0.46 or higher with the corresponding quality indicators. This result indeed confirms the close association between productivity and quality performance. The quality indicator that was found to exhibit the highest correlations with the respective productivity indicators was *internal process satisfaction* (Avg $r = 0.603$; $p < 0.01$). The especially high correlation between internal process satisfaction and cost effective production ($r = 0.739$; $p < 0.01$) demonstrates that an emphasis on continuous process improvement, which is one of the cornerstones of total quality management, will ultimately result in more cost effective production and thus improved productivity and profitability.

The quality indicator that exhibited the second highest average correlation with the productivity measures was the extent to which work output by peers is consistently delivered accurately (Avg $r = 0.532$; $p < 0.01$). This finding suggests that an emphasis on the quality of work output by everybody in the organization will result in more efficient and timely operations which in turn positively affect productivity. External customer satisfaction was the third quality indicator that was found to be highly associated with the productivity (Avg $r = 0.519$; $p < 0.01$). This finding in essence validates the main hypothesis of this study and Deming's assertion that a quality driven culture which makes external customer satisfaction a number one priority will ultimately function in productive ways as well. It is widely known that external customers demand timely services as well as reliable and functional products at a reasonable price. Thus, organizations that are truly customer driven are the ones that are characterized by streamlined, timely, and efficient processes as well as a special focus on product quality. Given that streamlined, timely, and efficient processes as well as product quality result in speed, less waste and rework, it is not surprising that external customer satisfaction was found to be highly associated with all productivity indicators.

The other three quality indicators that were found to exhibit an average correlation of 0.5 or higher with the productivity ones were the extent to which work output by peers is consistently delivered complete (Avg $r = 0.513$;

Table 1. *Pearson Correlations Between Productivity and Quality Indicators*

| **Quality Indicators** | **Productivity Indicators** | | | |
|---|---|---|---|---|
| | Amount of work output by peers exceeds expectations | Inputs are received from others in a timely fashion | Products or services are produced in a cost effective manner | Average correlation of each quality indicator |
| Internal process satisfaction | .569** | .502** | .739** | .603** |
| Work output by peers is consistently delivered accurately | .465** | .616** | .516** | .532** |
| External customer satisfaction | .623** | .387** | .547** | .519** |
| Work output by peers is consistently delivered complete | .422** | .653** | .465** | .513** |
| Satisfied with quality of peer work output | .450** | .590** | .494** | .511** |
| No change or rework needed after final products are produced | .524** | .406** | .580** | .503** |
| Produced products/services meet specifications | .486** | .345** | .623** | .485** |
| On-time delivery of products/services | .431** | .471** | .540** | .481** |
| External customer loyalty | .409** | .391** | .498** | .433** |
| Employees react quickly to resolve unexpected problems | .452** | .411** | .342** | .402** |
| No scrap produced | .315** | .292** | .348** | .318** |
| Average correlation of each productivity indicator | .467** | .460** | .518** | |

** Correlation is significant at the 0.01 level (2-tailed). Listwise N=182



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$p < 0.01$), the extent to which employees are satisfied with the quality of work output they receive from their peers (Avg $r = 0.511$; $p < 0.01$), and the extent to which no change or rework is needed after the final products are produced (Avg $r = 0.503$; $p < 0.01$). Again these three correlations together empirically validate the strong association between productivity and quality performance and the importance of making quality a top priority. In terms of the remaining correlations displayed in Table 1, the quality indicators below were found to exhibit the following correlations: produced products or services meet specifications (Avg $r = 0.485$; $p < 0.01$); on-time delivery of products or services (Avg $r = 0.481$; $p < 0.01$); external customer loyalty (Avg $r = 0.433$; $p < 0.01$); employees react quickly to resolve unexpected problems (Avg $r = 0.402$; $p < 0.01$); and, no scrap produced (Avg $r = 0.318$; $p < 0.01$). In all, the results of the correlational matrix displayed in Table 1 indicate a high association between quality and productivity performance and thus the compatibility of the quality management and productivity improvement interventions. In sum, the correlational data in Table 1 empirically validates Deming's assertion that as quality improves, costs decrease because of less rework, fewer mistakes, and fewer delays.

*Regression Analyses.* As shown in Table 2, the three stepwise regression models identified the stronger predictors of each one of the productivity indicators. Interestingly enough, the strongest predictor for each productivity indicator pertained to a quality indicator, which once again demonstrates the strong association between productivity and quality performance.

With regard to the first productivity indicator, *"amount of work output by peers exceeds expectations"*, the five predictors selected by the stepwise regression model accounted for 50.4% of its total variance. Accounting for 35.5% of the total variance, external customer satisfaction was found to be by far the strongest predictor of work output exceeding expectations. This finding in essence confirms the importance of having an organizational culture that is customer driven and highlights that quality and productivity are not antithetical constructs. Quality does indeed yield productivity gains. The second predictor selected by the regression model was the extent to which employees in the organization receive rewards based on their performance. In a way this finding validates expectancy theory and demonstrates that when an employee believes that his or her performance will result in desired outcomes then he or she will be more motivated to perform. The third predictor into the model was the extent to which the organization does not have turnover problems. This result is important in the sense in today's constantly downsizing and restructuring corporate world employee commitment has become a secondary concern. Yet, as the results of this regression model show, employee turnover problems can be detrimental to productivity and hence organizational competitiveness. Turnover causes disruptions to operations, especially when key and talented people leave the organization. It takes a while and often considerable training before newcomers reach the same proficiency level. Thus, building organizational systems capable of attracting and retaining employees can be considered very important when employee output is of prime concern.

The last two variables selected by the stepwise regression model were the extent to which no change or rework is needed after the final products are produced as well as the extent to which the employee is motivated to transfer the newly learned skills and knowledge back to the job. With regard to the former variable, it is clear that the less the organization invests its energies and manpower to redoing defective work the more productive it will be. Further, this finding once again validates Deming's philosophy—i.e. a focus on quality will ultimately result in productivity gains and cost reduction due to less rework, fewer mistakes, and fewer delays—and thus reinforces the notion there is a strong association between quality and productivity performance. In terms of motivation to transfer, its inclusion in the regression model exemplifies the importance of training transfer and why the organizational environment should be designed to facilitate it. Simply put, the more employees transfer what they learn back to the job, the more productive they will be.

The second stepwise regression model in Table 2 pertains to the productivity indicator of *"cost effective production"*. In all, the five predictors selected by this regression model accounted for 65.4% of the total variance of this productivity indicator. The strongest predictor by far was internal process satisfaction, which accounted for 54.7% of the total variance of cost effective production. Taking also into consideration the fact that internal process satisfaction was found to exhibit the highest average correlation with all productivity indicators (Avg $r = 0.603$; $p < 0.01$), it is safe to conclude that interventions, such as TQM, lean manufacturing, Kaizen, or 5S practices, that are designed to improve the processes in the organization will be the most likely to yield the biggest productivity gains. The remaining independent variables selected by the regression model were: the extent to which the employee has influence on the performance ratings his or her peers receive; produced product or services meet established specifications; the employee has learning and growth opportunities in the organization; and, product or service quality is measured at every step of the process. Collectively the five predictors reveal that an organization will be more likely to operate in a cost effective manner if there is a great emphasis on process improvement, quality measurement, a high performance team environment that allows peers to evaluate the performance of each other,

and plenty of learning and growth opportunities. In short, all these predictors reflect characteristics of a quality driven culture and thus once again demonstrate the strong association between quality and productivity.

The last regression model incorporated in Table 2 belongs to the productivity indicator *"inputs are received from others in a timely fashion"*. The nine predictors included in the model accounted for 65.4% of the total variance of the dependent variable. Once again, the strongest predictor in the model pertained to a quality indicator—the extent to which work output by peers is consistently delivered in a complete fashion—which in turn accounted for 43.1% of the total variance. In total, four of the nine independent variables selected by the regression model were quality management (QM) variables, which again demonstrates the strong association between productivity and quality. In particular, aside from the extent to which work outputs by peers are consistently delivered in a complete fashion, satisfaction with quality of peer work output, quick employee reaction to resolve unexpected problems, and quality measurement were the other QM variables that were found to be significant predictors of the dependent variable. Together, these QM variables reflect an organizational culture that emphasizes the key TQM components of measurement, speed, and quality work.

Table 2. *Stepwise Regression Models for Productivity Indicators*

| Amount of work output by peers exceeds expectations | Cost effective production | Inputs are received from others in a timely fashion |
|---|---|---|
| External customer satisfaction<br>$R^2$= 0.355 | Internal process satisfaction<br>$R^2$= 0.547 | Work output by peers is consistently delivered in a complete fashion<br>$R^2$= 0.431 |
| Rewards are based on performance<br>$\Delta R^2$= 0.067 | Have influence on performance ratings peers receive<br>$\Delta R^2$= 0.049 | Receive praise and recognition when doing good work<br>$\Delta R^2$= 0.066 |
| No turnover<br>$\Delta R^2$= 0.042 | Produced products/services meet specifications<br>$\Delta R^2$= 0.032 | Knowledge of expectations<br>$\Delta R^2$= 0.031 |
| No change or rework needed after final products are produced<br>$\Delta R^2$= 0.019 | Learning and growth opportunities<br>$\Delta R^2$ = 0.012 | Satisfied with quality of peer work output<br>$\Delta R^2$= 0.029 |
| Motivated to transfer newly learned skills and knowledge back to the job<br>$\Delta R^2$= 0.022 | Product or service quality is measured at every step of the process<br>$\Delta R^2$= 0.014 | Multiskill work environment<br>$\Delta R^2$= 0.027 |
| | | Receive supervisory feedback about performance<br>$\Delta R^2$= 0.020 |
| | | Someone at work has talked to me about my progress<br>$\Delta R^2$ = 0.018 |
| | | Employees react quickly to resolve unexpected problems<br>$\Delta R^2$ = 0.0178 |
| | | Product or service quality is measured at every step of the process<br>$\Delta R^2$= 0.013 |
| $R^2$ = 0.504<br>Adjusted $R^2$ = 0.484<br>F = 25.61***<br>N = 131 | $R^2$ = 0.654<br>Adjusted $R^2$ = 0.640<br>F = 47.55***<br>N = 131 | $R^2$ = 0.654<br>Adjusted $R^2$ = 0.629<br>F = 25.67***<br>N = 131 |

*** $p < .001$

The remaining five variables in the regression model pertained to the extent to which the employee: a) receives praise and recognition when doing good work; b) knows of what is expected of him or her at work; c) functions in a multiskill work environment; d) receives supervisory feedback about his or her performance; and, e) has discussed his or her progress with someone in the organization. In all, these five variables together suggest that inputs from others will be received in a timely manner if performance takes place in a multiskill work environment within which



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job expectations are made clear and the employee receives frequent feedback and recognition for his or her performance and progress. Special attention should be given to the importance of a multiskill work environment, since it affects performance in at least two ways. First, research has shown that a multiskill work environment facilitates job motivation, which in turn positively affects job performance (Hackman & Oldham, 1980; Pasmore, 1988). It should also be noted however, that a multiskill work environment is especially important in a manufacturing setting because it assists in alleviating absenteeism and delay related problems. It is no secret that nowadays most facilities function with a very lean workforce and thus the speed of their operations can be severely undermined by absenteeism problems. A strategy many manufacturing organizations use is to train their employees on multiple skills so that if an employee is absent a colleague can quickly step in and assume his or her role. That way any operational delays are avoided and the system is still able to conduct its operations in a timely manner. Thus, it should not be considered a surprise that this study has found the variable pertaining to a multiskill work environment to be a predictor of timely operations. In short, this result follows and validates existing manufacturing practices.

**Summary and Conclusions**

The results of this study provide empirical evidence of a strong link between quality and productivity. Both the correlation and regression analyses indicated positive and significant relationships between quality and productivity indicators. In particular, the correlational data in Table 1 indicated that each of the three productivity indicators exhibited an average correlation of 0.46 or higher with the eleven quality indicators included in the study. The quality indicators that were found to exhibit the highest correlations with the corresponding productivity indicators were: internal process satisfaction; work output by peers is consistently delivered in an accurate fashion; external customer satisfaction; work output by peers is consistently delivered in a complete fashion; satisfaction with quality of peer work output; and, no change or rework needed after the final products or services are produced. In terms of the regression analyses, the results in Table 2 show that the quality indicators of external customer satisfaction, internal process satisfaction, and work output by peers is consistently delivered in a complete fashion were proven to be the strongest predictors of productivity performance.

Another important conclusion that stems from the results of this study is that organizational emphasis on continual improvement of processes and quality will ultimately result in more cost-effective production, which in turn improves both productivity and profitability. A practical example that pertains to this approach is the latest achievement of Toyota Motor Corporation. Due to heavy reliance on continuous process improvement, which is a cornerstone of TQM and Lean Manufacturing principles, Toyota has been able to reduce its production costs to such an extent that it will be able to manufacture a more advanced and improved vehicle at 3-7% less than last year's model (Toyota information seminar, 2001). What is most interesting about Toyota's achievement is that other major competitors face higher costs and shrinking market shares and profits at this time.

In all, ten of nineteen variables that most strongly predicted productivity outcomes were quality management variables. Overall these ten quality management variables accounted for the majority of the variance of the corresponding productivity regression models. Based on this finding one can thus conclude that quality and productivity performance are indeed closely interrelated and one should not consider them as antithetical phenomena. Rather, investments in quality should be perceived as a means to higher customer satisfaction , greater market share, and ultimately productivity gains.

The importance of organizational variables such as performance rating of peers, performance based rewards, praise and recognition for good work, and knowledge of expectations are also seen in this study. All of these had a positive impact on productivity indicators as demonstrated in the regression analysis. These organizational variables represent classic TQM and STS social system activities, which underscore the importance of employee motivation and satisfaction for organizational success.

In terms of previous research, the results of this study are consistent with the results of the Kontoghiorghes and Bryant (2001) study. In short, both studies have found all productivity and quality indicators to be positively and significantly correlated. Further, both studies identified the quality indicators of "internal process satisfaction" and "work output by peers is consistently delivered in a complete fashion" to be the strongest predictors of "cost effective production" and "inputs are received from others in a timely fashion" respectively. Therefore, despite the fact both studies were conducted in very different work environments, one may conclude that they both ascertain the strong association between productivity and quality performance and support the assertion by quality experts such as Deming, Feigenbaum, and Imai that improvements in quality do also create improvements in productivity. Lastly, both studies identify "internal process satisfaction" and "work outputs by peers is consistently delivered in a complete fashion" as the most important quality indicators for productivity performance.

**Implications for HRD practice, Limitations, and Future Research**

An important implication for HRD practice is the empirical evidence this study provides that Deming's concept is valid that quality improvement also improves productivity. This means HRD practitioners must draw upon TQM and related concepts that support quality improvement in order to assist their organizations to be competitive and productive. The results and conclusions of this study are limited, however, to this sample of manufacturing facilities in the automotive parts industry. Further research is suggested to gather additional empirical evidence about the relationships between quality and productivity in other organizational settings and industries.

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# Tri-Dimensional Social Support from Supervisor and Multilevel Performance in Governmental Units in Thailand

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*This study examined the relationship between supervisory social support and performance of subordinates and groups. Usable data of 355 pairs of supervisor-subordinates working in health centers in Thailand were used. The results revealed that gender was associated with support receiving in effecting subordinate performance. Dimensions of supervisory social support also predicted performance in subordinate and group levels. Self-efficacy was an important predictor of group performance. Discussion, implications for HRD in Thailand, limitations, and recommendations for future research are presented.*

Key words: Supervisory Social Support, Subordinate Performance, Group Performance

Performance is a key (Swanson, 1994) for organizational survival and effectiveness. Scholars and researchers have been searching for determining factors that influence performance. Research on performance, especially in individual level has been received considerable and sustained attention in many fields of study including organizational psychology and human resource development (HRD). The findings from research studies in these fields found many possible factors that affect performance. Supervisor has been suggested as one of them.

During the last two decades, research in organizational context in Thailand and other countries has generally revealed positive consequences of support from supervisors. It was positively related to subordinate's work motivation, such as job satisfaction (e.g., Sorod & Wongwattanamongkol, 1996), commitment to work (e.g., Littrell, Billingsley, & Cross, 1994), and quality of work life (Bhathumnavin[1], Vanintananda, & et al., 1997) . Support from supervisors was also found to reduce job stress (e.g., Etzion & Westman, 1994), burnout (e.g., Eastburg, Williamson, Gorsuch, & Ridley, 1994) , health problem related to work (e.g., Blau, 1981), and health care cost (e.g., Manning, Jackson, & Fusilier, 1996). Furthermore, supervisory support was also found to enhance subordinate's transfer of training (e.g., Gregoire, Propp, & Poertner, 1998). These variables are associated with performance.

## Supervisory Social Support and Performance in Group Context

The need for improving performance demands scholars and researchers to devote their efforts in searching for factors that influence the performance. Since Thailand has been affected by economic crisis, it is suggested that one of the most direct ways for improving performance of working groups in organization is to developing human resources. Such efforts should be emphasized on supervisors (Bhanthumnavin[2], 2000) which can be more beneficial to both supervisors, as well as to the subordinates. This is because supervisors are not only motivating subordinates to work, but also controlling and managing the immediate resources of the workgroup. Their behaviors, thus, can also greatly impact subordinates in both direct and indirect ways, as well as in both positive and negative directions.

Since 1981, a new approach for assessing supervisor's behaviors at work, so-called "supervisory social support" (SSS), has been introduced (House, 1981). SSS, generally consisted of at least three major dimensions: emotional support, informational support, and material support (Cohen & Wills, 1985; House, 1981), was associated to subordinate performance in many Thai studies. For example, a study employing 403 Thai teachers was conducted by Nirunthawee (1989). The part of study examined social support including from supervisors on subordinate performance. The researcher found that teachers' performance in terms of self-reported work effectiveness was positively related to social support. The similar result was found in other Thai studies using similar group of samples (e.g., Iedbuar, 1991; Koonprasert, 1992), and in nurese (Phosrithong, 1993), executive officers (Sorod & Wongwattanamongkol, 1996), and police officers (Pinpradit, in press).

The results from Nirunthawee's study, moreover, revealed the positive relationship between social support including from supervisors and performance in terms of supervisory rating. Other Thai studies also found the similar result (e.g., Na Wanjun, 1993). However, it should be pointed out that these above studies assessed many sources of social support (supervisors, coworkers, family and friends) at the same time in one measure. Thus, SSS was not fully studied in terms of its multi-dimensions in different work situations.

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Furthermore, there is little evidence of the relationship of SSS and group performance. The assumption being made in Thailand is that SSS should lead to performance in both subordinate and group levels. The empirical results in this area are much in need.

**Other Factors that Affect Performance in Group Context**

Besides SSS, there are other factors affecting performance in workgroups. Perceived organizational support (POS) was suggested to impact on subordinate performance through subordinate's commitment to work (e.g., Eisenberger, Fasolo, & Davis-LaMastro, 1990), prosocial behavior in terms of in-role and extra-role behaviors (e.g., Lee, 1995; Settoon, Bennett, & Liden, 1996), and organizational citizenship behavior (e.g., Lynch, Eisenberger, & Armeli, 1999). Many researchers would argue that subordinate's psychological characteristics which affect work motivation can also play important role on their performance, such as self-efficacy (Bandura, 1986; 2000), and work overload (e.g., Chiles, 1982). Self-efficacy and work overload were also found together with SSS or social support in having interaction effect on individual performance (e.g., Ballentine & Nunns, 1998; Glaser, Tatum, Nebeker, Sorenson, & Aiello, 1999). Studies on the relationship of these variables were rarely found in Thailand. Thus, there is the need to examine their effects on performance of subordinates and groups.

**Purpose of The Study**

A key problem in HRD is to determine factors that influence the performance of subordinates and groups. One strong possible factor is SSS. The main purpose of this study is to investigate the relationship between SSS and performance of subordinates and groups. The second purpose is to examine the effect of other potential factors on the performance in these two levels. Furthermore, this study compared and contrasted these effects in different types of subordinates. There were three research hypotheses in this study.

Hypothesis 1: Subordinates reporting high degree of emotional support, informational support, and material support will get higher supervisory rating than those reporting low degree on all of these three-support dimensions. This result will be found in female subordinates rather than in male subordinates.

Hypothesis 2: Emotional support, or informational support, or material support, will be positively related to work effectiveness, or supervisory rating, or group performance.

Hypothesis 3: Self-efficacy will be associated with group performance.

**Methodology**

*Sample*

The respondents were 972 matched pairs of supervisor-subordinates working in health centers in six provinces in Thailand. Without follow up, 542 supervisors and 517 subordinates returned usable questionnaires which yielded response rate of 56% and 53%, respectively. Of these numbers, data from only 355 pairs were used. The subordinate participants consisted of 150 males, and 204 females with one unidentified on gender. Their age ranged between 18-58 with the average of 30.48 years old (SD = 5.93). The supervisor participants were 148 males and 203 females with four unidentified on gender.

*Measure*

All measures were written in Thai language. Most of them were summated rating measures, with 6-point Likert scale ranging from "very true" to "not at all true". The details of each measure are as below.

*Supervisory social support (SSS)*. This measure was constructed by the researcher based on literature (e.g., House, 1981) and existing measures (e.g., Niruthawee, 1989). This measure assessed perception of subordinate on supervisor's behaviors in three dimensions: emotional support (e.g., showing respect and appreciation), informational support (e.g., giving advice or guidance related to work), and material (e.g., providing needed resources, services, and goods). It consisted of 10 items for each dimension with the total of 30 items. Reliability in terms of alpha coefficient show satisfactory results in emotional dimension ($\alpha$ = .9413), informational dimension ($\alpha$ = .9168), material dimension ($\alpha$ = .9168), and total measure ($\alpha$ = .9702).

*Perceived organizational support (POS)*. This measure was constructed by the researcher based on Eisenberger, Huntington, Hutchinson, & Sowa, (1986)'s concept. The measure consisted of 15 items assessing subordinate's perception on supports from organization in terms of being valued, being cared about, and working in flexible environment. Alpha coefficient was .8670.

*Self-efficacy*. The researcher constructed the measure based on Bandura's (1982; 1986; 2000) concept. It is consisted of 15 items assessing the belief of subordinate that he or she has capability to perform a task. Alpha coefficient was .8117.

*Work overload*. Base on literature and interview results, the researcher constructed this measure, consisting of 10 items. The items assessed work overload from view point of subordinate in terms of being in the work conditions that require beyond his or her normal role. Alpha coefficient was .8487.

*Work effectiveness*. The researcher constructed this measure based on literature and interview results. This measure consisted of 10 items. The subordinates were asked how well they can perform the jobs in terms of quality, quantity, and time. Alpha coefficient was .7212.

*Supervisory rating*. Supervisors were asked to rate a subordinates regarding his or her performance in terms of quality, quantity, and time within the past six months. Constructed by the researcher, it consisted of 15 items. Alpha coefficient was .9206.

*Group performance*. Group performance, related to organizational missions, was rated by supervisors in terms of quality, quantity, and time. This measure, total of 15 items, was constructed by the researcher with alpha coefficient of .8660.

*Location of workplace*. Subordinates were asked to identify the distance between their health center and provincial capital (urban area) in terms of kilometers.

Descriptive data and correlation among measures are displayed in Table 1.

Table 1. *Descriptive data and correlations among variables in the study*

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Gender | - | - | - | | | | | | | | | | | |
| 2. Age | 30.48 | 5.93 | .25[b] | - | | | | | | | | | | |
| 3. Ed | 14.89 | 1.08 | .03 | -.14[b] | - | | | | | | | | | |
| 4. KM | 30.68 | 30.93 | -.08 | -.19[b] | -.02 | - | | | | | | | | |
| 5. POS | 49.01 | 11.65 | .03 | -.05 | -.20[b] | .05 | - | | | | | | | |
| 6. SE | 66.37 | 8.51 | -.06 | -.05 | .02 | .02 | .16[b] | - | | | | | | |
| 7. WO | 40.59 | 5.72 | .01 | .03 | .15[b] | .05 | -.37[b] | -.04 | - | | | | | |
| 8. Emo | 41.90 | 11.13 | -.12[a] | -.12[a] | -.11[a] | .06 | .30[b] | .14[a] | -.21[b] | - | | | | |
| 9. Info | 41.12 | 10.11 | -.08 | -.10 | -.18[b] | .06 | .31[b] | .15[b] | -.21[b] | .89[b] | - | | | |
| 10. Mat | 41.75 | 10.34 | -.08 | -.07 | -.14[b] | .02 | .36[b] | .14[b] | -.24[b] | .80[b] | .84[b] | - | | |
| 11. WE | 42.70 | 5.53 | .13[a] | .01 | .09 | .06 | .11[a] | .55[b] | -.04 | -.07 | -.03 | .02 | - | |
| 12. SR | 62.17 | 12.23 | .04 | -.13[a] | .06 | .11[a] | .03 | .04 | .05 | .24[b] | .18[b] | .22[b] | .05 | - |
| 13. GP | 72.89 | 7.77 | .04 | .07 | .15[b] | .04 | -.02 | .18[b] | -.08 | .08 | .09 | .13[a] | .12[a] | .24[b] |

[a] $p < .05$; [b] $p < .01$ (two-tailed) Note: Ed (Education) ,KM (Location of workplace), POS (Perceived organizational support), SE(Self-efficacy), WO (Work overload), Emo (Emotional support), Info (Informational support), Mat (Material support), WE (Work effectiveness), SR (Supervisory rating), and GP (Group performance).

***Results***

Hypothesis 1 was tested by 3-way ANOVA to find the interaction effect of emotional support, informational support, and material support on supervisory rating in female subordinates and male subordinates. As expected, this interaction was found only in female subordinates (see Table 2). Results from post hoc test in terms of Scheffe indicated that female subordinates reporting high degree of all three support dimensions got higher supervisory rating than those reporting low degree of all three dimensions. Thus, the hypothesis 1 was supported.

Furthermore, the results in male subordinates revealed only a main effect of informational support. The result surprisingly indicated that male subordinates reporting low informational support ($\bar{x}$ = 66.29) were rated by their

Table 2. *Analysis of variance for supervisory rating in female subordinates and male subordinates*

| Source | Supervisory Rating | | | | | |
|---|---|---|---|---|---|---|
| | Female subordinates | | | Male subordinates | | |
| | df | MSE | F | df | MSE | F |
| Emotional support (A) | 1 | .40 | .003 | 1 | 467.16 | 3.58 |
| Informational support (B) | 1 | 114.06 | .76 | 1 | 784.33 | 6.00 [a] |
| Material support (C) | 1 | 6.91 | .05 | 1 | 115.06 | 0.88 |
| A x B | 1 | 6.87 | .05 | 1 | 277.18 | 2.12 |
| Ax C | 1 | .83 | .006 | 1 | 222.18 | 1.70 |
| B x C | 1 | 4.10 | .03 | 1 | 5.81 | 0.45 |
| A x B x C | 1 | 1087.40 | 7.28 [b] | 1 | 4.09 | 0.31 |
| Error | 186 | 149.42 | | 138 | 130.68 | |
| Total | 194 | | | 146 | | |

[a] $p < .05$, [b] $p < .01$

supervisor as more effective than those reporting high informational support ($\bar{x}$ = 58.49).

In order to test hypothesis 2 and 3 concerning the contribution of variables, multiple regressions were performed on work effectiveness, supervisory rating, and group performance. Data were analyzed in total sample and in four subgroups. In the first step, subordinate's personal background variables were entered in the equations. Results from Table 3-5 indicated that gender made a significant contribution only to work effectiveness in total sample and in young subordinates. Age was found to be a significant predictor of supervisory rating in total sample and in female subordinates, as well as, of group performance in total sample. Education did also make a significant contribution only to group performance, especially in old subordinates.

Subordinate's psychological characteristics and situational factors were entered in the second step in all equations. In addition, work effectiveness and supervisory rating were added in this step only for the equation of group performance. It was found that self-efficacy made a significant contribution to work effectiveness in all groups, as well as to group performance in total sample and especially in female subordinates and in young subordinates. The results suggested that high self-efficacy subordinates rated themselves as more effective and were in centers with higher performance than relatively low self-efficacy ones. POS was found to be a significant predictor of work effectiveness, especially in old subordinates. Old subordinates with high POS reported higher work effectiveness that those with relatively low POS. Location of workplace also made a significant contribution to work effectiveness and group performance in male subordinates, and to supervisory rating in old subordinates. The results suggested that these subordinates who reported that their centers were not located near urban area (provincial capital) also reported higher work effectiveness, got higher supervisory rating, and/or their groups were more effective than their counterparts.

After partialing out the effects of subordinate's personal background, psychological characteristics, and situational factors, two of the three dimensions of SSS were significantly related to performance. First, emotional support made a significant contribution only to subordinates performance in terms of work effectiveness and supervisory rating, The results of both types of performance were found in total sample, female subordinates and young subordinates (see Table 3 and 4). The findings suggested that subordinates reporting higher emotional support got higher supervisory rating than those with relatively low emotional support. On the contrary, high emotional support subordinates, instead, rated themselves as less effective than the relatively less emotional support ones.

Secondly, material support was also found to make a great contribution to performance in both subordinate and group levels (see Table 3-5). The results suggested that subordinates reporting higher material support also reported higher work effectiveness (total sample, female subordinates, and young subordinates), got higher supervisory rating (total sample), and were in the centers with higher performance (young subordinates only).

Thus, the results on work effectiveness and supervisory rating in total sample and two subgroups with the result on group performance in young subordinates supported the hypothesis 2. The hypothesis 3 was supported from the results on group performance in total sample, and two subgroups.

Table 3. *Multiple Regression for Work Effectiveness in Total Sample and Four Subgroups*

| Predictors | Work Effectiveness | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male Subordinates | | | Male Subordinates | | | Female Subordinates | | | Young Subordinates | | | Old Subordinates | | |
| | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total$R^2$ | β | $\Delta R^2$ | Total$R^2$ | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ |
| *Step 1* | | | | | | | | | | | | | | | |
| Ed | .10 | | | .10 | | | .10 | | | .03 | | | .18 [a] | | |
| Age | -.05 | | | -.02 | | | -.06 | | | | | | | | |
| Gender | .15[a] | | .03[a] | | | .01 | | | .01 | .16[a] | | .03 | .12 | | .05[a] |
| Step 2 | | | | | | | | | | | | | | | |
| KM | .07 | | | .19[a] | | | -.01 | | | .07 | | | .08 | | |
| POS | .06 | | | .12 | | | .03 | | | -.00 | | | .16 | | |
| SE | .55[d] | | | .50[d] | | | .60[d] | | | .56[d] | | | .52[d] | | |
| WO | .004 | .32[d] | .35[d] | .02 | .31[d] | .32[d] | .01 | .36[d] | .37[d] | .06 | .32[d] | .34[d] | -.06 | .34[d] | .38[d] |
| Step 3 | | | | | | | | | | | | | | | |
| Emo | -.26[a] | | | -.16 | | | -.38[b] | | | -.46[c] | | | -.08 | | |
| Info | -.03 | | | -.04 | | | .02 | | | .14 | | | -.17 | | |
| Mat | .19[a] | .03[b] | .38[d] | .07 | .02 | .34[d] | .31[b] | .04[b] | .41[d] | .31[b] | .06[c] | .39[d] | .04 | .04[a] | .42[d] |

[a] $p < .05$, [b] $p < .01$, [c] $p < .001$, [d] $p < .000$ Note: Ed (Education), KM (Location of workplace), POS (Perceived organizational support), SE (Self-efficacy), WO (Work overload), Emo (Emotional support), Info (informational support), and Mat (Material support).

Table 4. *Multiple Regression for Supervisory Rating in Total Sample and Four Subgroups*

| Predictors | Supervisory Rating | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Sample | | | Male Subordinates | | | Female Subordinates | | | Young Subordinates | | | Old Subordinates | | |
| | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total$R^2$ | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ |
| *Step 1* | | | | | | | | | | | | | | | |
| Ed | .08 | | | .07 | | | .08 | | | .06 | | | .10 | | |
| Age | -.16[b] | | | -.08 | | | -.19[b] | | | | | | | | |
| Gender | .05 | | .03[a] | | | .01 | | | .04[a] | .07 | | .01 | -.03 | | .01 |
| Step 2 | | | | | | | | | | | | | | | |
| KM | .10 | | | .11 | | | .10 | | | .05 | | | .23[b] | | |
| POS | .02 | | | -.10 | | | .09 | | | .04 | | | .05 | | |
| SE | .01 | | | -.01 | | | .04 | | | .04 | | | -.02 | | |
| WO | .05 | .01 | .04 | .05 | .03 | .04 | .05 | .02 | .06 | .14 | .02 | .03 | -.02 | .06 | .07 |
| Step 3 | | | | | | | | | | | | | | | |
| Emo | .31[a] | | | .11 | | | .43[a] | | | .33[a] | | | .28 | | |
| Info | -.27 | | | -.16 | | | -.29 | | | -.26 | | | -.27 | | |
| Mat | .20[a] | .06[d] | .10[d] | .27 | .05 | .09 | .14 | .08[b] | .14[c] | .18 | .06[c] | .09[a] | .26 | .06[a] | .13[a] |

[a] $p < .05$, [b] $p < .01$, [c] $p < .001$, [d] $p < .000$ Note: Ed (Education), KM (Location of workplace), POS (Perceived organizational support), SE (Self-efficacy), WO (Work overload), Emo (Emotional support), Info (informational support), and Mat (Material support).

**Discussion**

This study examined the relationship between three dimensions of SSS and performance of subordinates and groups. The current data collaborated earlier findings (e.g., Vaux, 1985) concerning the association between gender and support receiving. The results revealed that female subordinates perceived more support than male subordinates. Furthermore, among female subordinates, the ones with high degree of all three-support dimensions got higher supervisory rating than those reporting low degree of all three-support dimensions. Regarding male subordinates, it was unexpectedly found that male subordinates reporting high informational support got lower supervisory rating than those reporting low informational support. Male subordinates may not need much informational support to improve their performance.



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Table 5. *Multiple Regression for Group Performance in Total Sample and Four Subgroups*

| Predictors | Group Performance | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Sample | | | Male Subordinates | | | Female Subordinates | | | Young Subordinates | | | Old Subordinates | | |
| | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ | β | $\Delta R^2$ | Total $R^2$ |
| *Step 1* | | | | | | | | | | | | | | | |
| Ed | .07 | | | .15 | | | .14 | | | .09 | | | .19 * | | |
| Age | .07[b] | | | .14 | | | .02 | | | | | | | | |
| Gender | -.01 * | | .03 * | | | .06 * | | | .02 | .03 | | .01 | -.05 | | .04 |
| Step 2 | | | | | | | | | | | | | | | |
| KM | .06 | | | .20 * | | | -.05 | | | .11 | | | -.01 | | |
| POS | -.07 | | | -.17 | | | .03 | | | -.07 | | | -.10 | | |
| SE | .18 [b] | | | .17 | | | .22 * | | | .20 * | | | .16 | | |
| WO | -.11 | | | -.07 | | | -.11 | | | -.08 | | | -.14 | | |
| WE | .01 | | | -.04 | | | .03 | | | -.08 | | | .12 | | |
| SR | .21 [d] | .09 [d] | .12 [d] | .26 [b] | .15 [c] | .20 [d] | .15 * | .10 [b] | .12 [b] | .24 [c] | .10 [b] | .11 [b] | .18 * | .10 * | .14 * |
| Step 3 | | | | | | | | | | | | | | | |
| Emo | -.22 | | | -.11 | | | -.28 | | | -.33 | | | -.15 | | |
| Info | .11 | | | .03 | | | .18 | | | .23 | | | -.03 | | |
| Mat | .20 | .02 | .14 [d] | .11 | .01 | .21 [b] | .26 | .04 | .16 [b] | .26 * | .05 * | .16 [b] | .21 | .01 | .15 * |

* $p < .05$, [b] $p < .01$, [c] $p < .001$, [d] $p < .000$ Note: Ed (Education), KM (Location of workplace), POS (Perceived organizational support), SE (Self-efficacy), WO (Work overload), WE (Work effectiveness), SR (Supervisory rating), Emo (Emotional support), Info (Informational support), and Mat (Material support)

The major contribution of the present study involves the evidences that dimensions of SSS predicted performance of subordinates and groups. In more details, emotional support was one of significant predictors of subordinate performance in terms of work effectiveness and supervisory rating. These results were found in total sample, and especially in female subordinates and in young subordinates. However, the direction of magnitude of emotional support in predicting these two types of performance was in the opposite. It was surprisingly found the negative direction in predicting work effectiveness. Further analyses revealed that this negative direction was found when subordinates reported high work overload, or high self-efficacy. Previous studies also suggested that receiving support can be hurt rather than help (Jung, 1987; Rook, 1984) when recipients are in high work overload because of increasing stress (e.g., Kaufman & Beehr, 1986). Supervisory support was also found to inhibit performance of subordinates with high self-efficacy in a recent study (Ballentine & Nunns, 1998)

Material support was also found to make a great contribution to performance in both subordinate and group levels. The results suggested that subordinates with high material support reported higher work effectiveness, got higher supervisory rating and were in the centers with higher performance than those with low material support. These results were found especially in young subordinates. Young subordinates who were new to their works might have perceived the importance of material or equipment related to their works, rather than old subordinates whose works became routinely. Thus, perceiving high material support increased their individual as well as their group performances.

Information support was not found to make contribution to performance in this study. This could be because supervisors in health centers may not be the important source of information. As directly assigned from the Ministry of Public Health or administration in provincal level to be trained by the job title, supervisors sent their subordinates to participate in meetings and training related that works. Thus, the subordinates received information directly rather than via their supervisors.

The relationship between self-efficacy and group performance is rarely studied. Many researchers suggested that, instead of self-efficacy, collective efficacy is more likely to be associated with group performance (e.g., Seijts, Latham, & Whyte, 2000). It is evident in this study that self-efficacy was one of the important predictors of group performance in total sample and in other two subgroups. The possible explanation is that health center is generally a very small work unit, consisting of one supervisor and 2-4 subordinates. Thus, in such a small group, the effect of employee's self-efficacy could be found in group performance.

**Implications for HRD in Thailand**

Training should be given to Thai supervisors in health centers to provide appropriate amount and types of support in terms of emotional support, informational support, and material support in order to produce positive impact to performance in both levels in different types of subordinates. Supervisors should also be taught to identify and train to provide support to subordinates with varying levels of work overload and self-efficacy. Regarding the subordinates in health centers, training to improve their self-efficacy is recommended in general, and especially for female subordinates and young subordinates. Supervisors can also enhance these subordinates' self-efficacy in many ways, such as, being a good exemplar, and verbal persuasiveness.

**Limitations**

The first limitation of this study is that it is nonexperimental. It should be caution to make statements of causality and generalization based on the results of this study. Furthermore, self-report data were used. It should be pointed out that this method might have the effect of artificially inflating relationship among variables. The researcher was also aware of the strong correlation among the three dimensions of perceived supervisory social support. However, the high correlation may not be avoided because these dimensions are suggested to be interrelated in nature (Fenlason & Beehr, 1994; Sarason, Sarason, & Pierce, 1990). The final limitation is that this study employed cross-sectional study.

**Recommendations for future study**

This study should be replicated in both private and government organizations in Thailand. Furthermore, experimental studies in creating and testing a social support training module for Thai supervisors should be done. Longitudinal studies in this topic are encouraged to assess supervisory social support in both providing and receiving overtime. Such studies should also take psychological characteristics and situational factors into account in order to get complete picture of the phenomenon. Condition seeking approach is also recommended by analyzing data in subgroups. This is because different subordinates or groups of subordinates may seek, perceive, and interpret social support from supervisors in different ways.

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# Continuous Improvement through TQM – A Case Study in Rhetoric

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*This paper discusses the relationship between TQM, organisational wide change initiatives and continuous improvement through a case study analysis of eight large UK organisations over a fifteen-year period. It develops and tests out an explanatory conceptual framework to inform the analysis. It explores the use and significance of rhetorical devices in the case study organisations to persuade people of the need to change continuously.*

Keywords: Continuous Improvement, Organisational Change, TQM

This paper originates from a case study review of Total Quality Programmes (TQPs) – defined as a suite of organisation wide change initiatives with a continuous improvement orientation - within seven large privatised (plus a candidate for privatisation) organisations in the UK between the period 1983-1997 (Basra 2001). Four of them operate in the service sector, four are manufacturing or production oriented. The smallest organisation employed between 7,500 and 8,000 staff, the largest between 125,000 and 240,000 staff over the period covered by the study. All of them experienced competition without governmental protection and seven of them were subjected to major downsizing. Nevertheless each of them meet the requirement of survival that as Hackman and Wageman (1995 p310) point out is the primary goal of TQM from the perspective of the movement's founders. For the purposes of the research a privatised organisation is defined as having involved a transfer from government ownership to private ownership since 1979, with many of the general public holding shares. An initial survey established provisional information on change in staff attitudes and behaviours over the period following privatisation. For example 71% said that their working practices and organisation understanding had been greatly enhanced, 61% had become actively involved in improving the quality of their work, 95% said they needed to fit in with the way their customers worked. Following this initial survey, for each of the case study organisations an audit trail was conducted, by means of company documentation and other sources, on quality in general and TQPs in particular. This resulted in a chronological account of the evolution of TQPs in each organisation from 1983-1997. The initial survey and the chronological accounts surfaced a number of common themes and approaches associated with TQPs as well as a mean average of 25 TQ related programmes per organisation with over 200 different names being used. Key themes and key words across the programmes were isolated and looked at in turn to identify origins of, inspiration behind and objectives of TQPs. The concept of change through continuous improvement, or associated terminology, was common across each case study organisation. Of particular interest was the identification of persuasive terminology used to convey the quality message and convince people of the need to change.

## Problem Statement

Walton (1999 p355) argued that 'it is no longer appropriate to treat HRD as a synonym for Training and Development.... Perhaps more than anything what epitomises this transformation has been the development starting in the 1980s of Total Quality management (TQM) initiatives in large organisations, often linked to cultural change programmes'. However the relationship between TQM and corporate change programmes maintains a problematic status in the literature. Hackman and Wageman (op cit.) comment that virtually every intervention ever tried by an organisation development consultant has somewhere or other been attributed to TQM. Continuous improvement is a term that is central to TQM thinking and by definition implies ongoing change. Harris (1995), accepts that 'continuous improvement efforts and TQM are often linked' but recognises that the connection between the two efforts is not clear. 'Efforts to bring a continuous improvement philosophy to organisations have been labelled both subsets of TQM programmes and as encompassing TQM' (Harris ibid. p 97). This paper seeks to provide a conceptual framework to clarify the relationship between TQM and macro corporate change initiatives, with particular reference to continuous improvement.

There have been a number of self-conscious attempts to use rhetorical imagery in populist literature dealing with organisational change. Naisbitt and Aburdene (1985.) state (p3) that 'the aim of this book is not just to inform but to inspire'. Peters and Waterman move from 'In Search of Excellence' to a 'Passion for Excellence' in their

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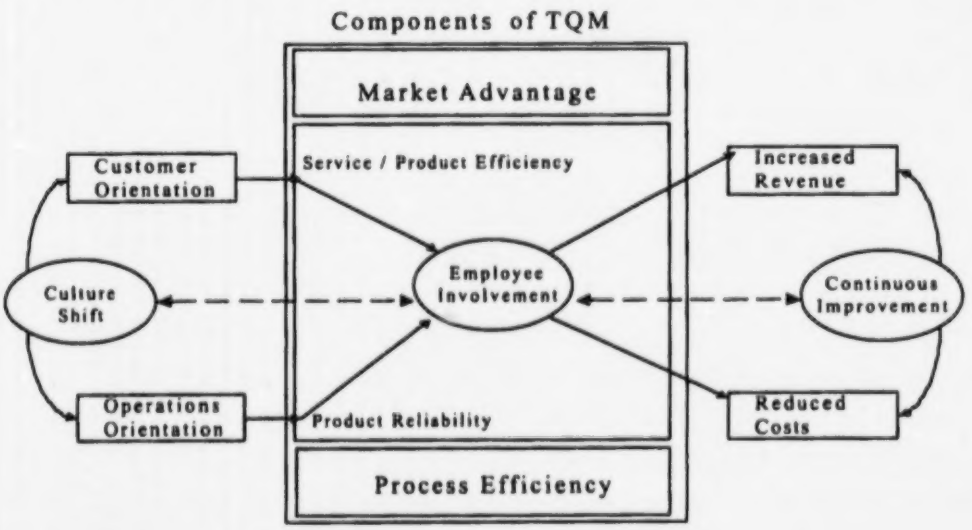
well known publications of the 1980s. Hackman and Wageman (op cit.) comment that 'the rhetoric of TQM is engaging, attractive and consistent with....the managerial *Zeitgeist* in the United States' (p 338). Pithy phrases and slogans from the quality gurus include: 'drive out fear', 'work smarter not harder' and 'it will not suffice to have customers that are merely satisfied' (Deming 1986); 'fitness for use' and 'managerial breakthrough' (Juran 1988); 'it is always cheaper to do the job right first time' and 'zero defects' (Crosby 1979). Rust et al (2000) pursue the implications of 'delighting the customer', which they note has became a term used in 'executive exhortations' in the marketing trade press since about 1990. Hackman and Wageman (op cit. p338) conclude that 'rhetoric is winning out over substance', restricting their observations to the US. In focusing on the actual terminology used over a period of fifteen years to propagate the message of 'continuous improvement', this paper explores this claim and its significance for change theory in a UK context.

**Theoretical Framework**

The concepts of quality and TQM have been subjected to significant academic scrutiny in recent years. Reeves and Bednar (1994), building on Garvin (1988), identify four separate roots of quality definitions – quality is excellence, quality is value, quality is conformance to specifications, quality is meeting and/or exceeding customer's expectations. A number of writers have tried to establish common content features of TQM programmes (Chang (1993, Waldman (1994) in which change and continuous improvement is emphasised. Reed et al (1996) have developed a framework for analysing the relationship between firm orientation and TQM content from a contingency perspective. Their model indicates that some organisations have a greater customer orientation focusing upon market advantage and increased revenue, whereas others have more of an operations orientation focusing upon process efficiency and reduced costs. They restrict it to the manufacturing sector but suggest that it could apply to firms in service industries. This paper builds on and extends the Reed et al framework, incorporating culture shift, employee involvement and continuous improvement, three factors mentioned by both Chang and Waldman above and figuring in the case study organisations. (Figure 1 below)




**Research Questions**

The first question asks about the relationship between TQM and macro culture change through investigating the concept of continuous improvement. The second question relates to identifying any differences in the terminology used to refer to continuous improvement between the case study organisations and, if so, could these be related to factors such as an operations orientation v a customer orientation? The third question addresses the issue of why should people accept exhortations to continuously improve and the nature of the persuasive terminology used? Has it changed over time and if so how? Is there any evidence in the UK that 'rhetoric is winning out over substance'?



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**Methodology**

A case study approach was adopted, described by Bogdan and Biklen (1992) as 'a detailed examination of one setting, or one single subject, or one single depository of documents, or one particular event'. In this instance it was one particular subject across a range of organisations. The study involves a retrospective analysis of phenomena occurring over the period 1983-1997 but goes beyond mere 'historical research'. Yin (1994 p8) argues that 'the case study relies on many of the same techniques as a history, but it adds two sources of evidence not usually covered in the historian's repertoire: direct observation and systematic interviewing. Again, although case studies and histories can overlap, the case study's unique strength is its ability to deal with a full variety of evidence – documents, artefacts, interviews and observations – beyond what might be available in the conventional historical study.' Archival research to establish key initiatives and supporting terminology over a given period was undertaken. Interviews were conducted with selected managers across each of the case study organisations, chosen because of their organisational knowledge, enabling rich sources of data to be obtained based on their experience, opinions, aspirations and feelings. Although its detailed analysis does not fall within the ambit of this paper, a questionnaire was circulated at the outset of the research to a cross section of 200 employees from 20 privatised organisations. This was designed to test out a series of propositions including that TQPs have been used across the privatised sector as a key tool towards achieving continuous improvement; and that communication and training are key to the introduction of any TQP.

This paper incorporates a rhetorical analysis of organisational texts to analyse key stylistic and other devices used in the case study organisations to try to convince people of the need to change. Summarising the excellent analysis provided by Leach (2000) *rhetorical analysis* can be defined as the analysis of persuasion attempts in oral performances or written texts. Politicians, for example, perform 'acts of persuasion' in their speeches. Trainers perform 'acts of persuasion' in their presentations. Top managers perform 'acts of persuasion' in their communications to staff and external stakeholders. This rhetoric is directed at a discrete audience that is expected to give some sign that it is persuaded by the arguments presented, classically through a change in behaviour or opinion. There are three persuasive genres or *stases:* forensic, epideictic and deliberative (Gross 1990, Fahnestock 1986). Forensic theory is the rhetoric of the law courts. Epideictic rhetoric is centred on contemporary issues, and on whether a certain individual deserves praise, blame or censure as in funeral orations and award ceremonies. Deliberative rhetoric is found in the arena of policy, where debate centres on outlining and eliciting commitment to courses of future action. The mode of persuasion is frequently speculative. The texts used in the case study organisations to propagate the change message can be described as *deliberative.* They included company annual reports, newsletters, magazines and videos.

The next stage of analysis draws upon the five 'canons' of rhetoric used by Cicero in classical Roman times. These canons are:- *Invention* - how arguments are 'invented' to achieve particular purposes through 'ethos' – the credibility of the author or speaker; 'pathos' – the appeal to emotion, and 'logos' – how logical arguments are used to convince us of their validity; *Disposition* - by what structural logic does the text or speech support its ultimate aims; *Style* - the relationship between the form of the discourse and the content. Style includes rhetorical tropes or 'figures of speech' such as metaphor and analogy; *Memory* - how a text or speech stays in the memory; how particular discourses call upon cultural memories shared by authors and their audiences, (Lipsitz 1990); *Delivery* - the relationship between the dissemination of a work and its content.

**The Emergence of TQM**

Most authorities on TQM locate the concept in the work of the so-called quality gurus, namely Feigenbaum, Crosby, Juran, Deming and Ishikawa and there have been a number of studies comparing some or all of their perspectives (eg Oakland 1989, Harris op cit.). Harris in tracing the evolution of TQM identifies the emergence of a customer focus and the development of traditional quality control techniques for use outside the production area where they originated, which made TQM applicable to other sectors such as service industries. He contends that as the need for a focus on the customer and the important role of employee involvement in successful quality management became clear, the term TQM began to replace the term Total Quality Control (TQC), first coined by Feigenbaum (1957) in the 1950s. TQC in turn was an attempt to move quality concerns from a narrow focus on statistical control within a production department to a wider, more systems thinking arena, albeit still from a manufacturing perspective. A number of the case study organisations specifically used the term TQM at some stage of their TQP life cycle. The first TQM programme in BT was launched in 1986 as an umbrella term to cover a range of Quality Improvement

initiatives. There was a strong customer orientation – quality was defined in 1987 as 'meeting the customer's (agreed) requirements at lowest cost...first time every time'.

**Continuous Improvement in the Literature**

It is unclear when the term 'continuous improvement' was first used. The concept underlies the Deming management method as defined by the Delphi panel in the 1950s (Anderson et. al (1994)). Deming (1986), in his '14 points for management to abide by when considering quality', referred to 'improving constantly and forever the system of production and service' to improve quality and productivity and to decrease costs. Juran first uses the term in 1988, in the 4th edition of his Quality control Handbook. Reed et al (op cit.) analyse 'continuous improvement' in terms of process improvement of operations in manufacturing. They argue that in TQM terms, the concept of continuous (process) improvement is considered as an efficiency tool, with strong affinities to *Kaizen* – 'the never ending attention to detail that reduces the effort and time that it takes to conduct operations' (Schmidt and Finnigan 1992). They recognise, however, a trend to move away from the earlier 'continuous process improvement orientation to the broader 'continuous improvement with a focus on the customer and market. Hunt (1993: 46) states that 'continuous improvement depends on both innovative and small incremental changes'. He quotes a report emanating from the Logistics Management Institute which states 'that no process, product or service ever attains perfection and that neither the customer's expectations nor the quality of service remains static.' Kiernan (1993) argues that in the 21st century, companies must embrace continuous improvement and change if they are to adapt to the competitive exigencies of speed, global responsiveness; the need to innovate constantly or perish. During the 1990s this came to be seen as both a commitment and a process. As stated by Gallagher and Smith (1997): 'the commitment to quality is initiated with a statement of dedication to a shared mission and vision and the empowerment of everyone to incrementally move towards the vision. The process of improvement occurs through the initiation of small, short-term projects and tasks that collectively are driven by the achievement of the long term vision and mission'.

Garvin (1994) comments that at the time of writing 'continuous improvement programmes are sprouting up all over as organisations strive to better themselves and gain an edge'. Whatever the themes underpinning such programmes, 'continuous improvement requires a commitment to learning' (p19). He proceeds to make a connection with the concept of a 'learning organisation'. A number of writers refer to 'continuous learning' as a feature of TQM, or as a feature of the 'learning organisation', which some see as a development from TQM. Pedler et al (1991) define a learning company as 'an organisation that facilitates the learning of its members and continuously transforms itself.' Walton (op cit.) challenges this notion of 'continuous transformation, contending that it is counter-intuitive to the notion of learning. 'Without any stability there is no sense of continuity or order, no time to enjoy and build on what has been achieved' (p383).

Continuous improvement is featured within the assessment criteria of some prestigious quality awards. It is specifically referred to in the European Quality Award (Business Excellence) model launched in 1992, under two headings. The first is *'People Management'* -'how the company releases the full potential of its people to improve its business continuously' - and the second is *'Processes'* – 'how processes are identified, reviewed and, if necessary, revised to ensure continuous improvements of the company's business'.

**Results and Findings**

*Continuous Improvement in the Case Study Organisations*

There are references to continuous improvement in each of the case study organisations, often in association with other TQ concepts, as can be seen in the following extracts. *BT (Service Sector):* "We will constantly improve the quality and capability of our products and services" (The Leadership Guide 1987). "We are committed to continuous improvement" –part of revised BT values which also included 'we put our customers first; we are professional; we respect each other; we work as one team' (1991). "Continuously improving levels of service" – one of aims of BT Customers First strategy which stated by way of introduction 'we are committed to providing our customers with a helpful, polite and world-class service' (1992). *BAe (Manufacturing Sector):* "To maintain exceptional customer satisfaction through continuous improvement whilst maintaining national and international Quality Systems Standards Approvals" –from Quality Strategy (1995). *Rover (Manufacturing Sector):* "TQ requires continuous improvements in everything we do, using and investing our resources effectively at all times to minimise total costs" (1985). 'Continuous improvement, total flexibility....and participation in quality action teams' - measures included within the New Deal programme (1992). "What has really changed at Rover as a result of our total quality programme is the company culture - the commitment to continuous improvement both as individuals

and in the contribution we make to the success of the business" (Rover Group CEO – 1994). *BA (Service Sector):* 'Maintaining constantly improving targets as a good employer as well as manifesting concerns for social and community opportunities and environmental standards wherever the company operates' (Vision statement 1986). *BAA (Service Sector):* "Achieving continuous improvements in the cost and quality of all process and services" (1992). "CI is all about customer service. CI needs staff involvement at every level. CI is a process of providing improvement, continuously" (1992). "Our continuous improvement philosophy seeks to enhance customer satisfaction cost-effectively and increase profits by meeting the evolving needs of our airline customers and their passengers" (1993). "Never ignore a problem - always look for a way of overcoming that problem. The best person to improve the company is YOU - because you are at the sharp end. You know what will work and you know what won't work so never be afraid to voice your opinion or your views. By working together and adopting CI as a daily philosophy we can ensure that BAA offers its customers the best service possible. CI - Making a Better Future today and every day" (BAA CI literature 1991). *BP (Production Sector):* Continuous improvement listed as one purpose of the initiative called 'Benchmarking Process'. Others listed; achieve 'Best in Class' cost structure; ensure cost competitiveness to attract investment; provide competitive advantage for each product: i.e. customer satisfaction and quality, reliability, delivery and cost; and survival (1992). *BS (Manufacturing Sector)*: Our aim is to provide all customers, internal and external, with quality products and services and to strive for continuous improvement –(from Teeside Works Mission Statement 1992*). RM (Service Sector)*: Customer driven strategy that moves RM to an "environment where a steady and continuous improvement of every thing RM do is a way of life" (1988). 'Continuous Improvement' - Key principle of Customer First programme- (1993- 1995). " We in RM have made great strides to quality improvement. We have set tough targets but these are necessary if we are to maintain and improve our position in the market place ... Quality improvement is a continuing path and we cannot afford to rest. Our reputation depends on everybody making a contribution and becoming involved" (Assistant MD 1994)

A textual analysis of the above continuous improvement statements identified other associated concepts/themes. The main themes were Customers (including service) - 6 companies made connections (4 from the service sector, 2 from manufacturing/ production). Employee involvement – 4 (3,1). Costs – 4 (1, 3). Business results – 3 (0, 3). Services – 3 (2, 1). Products – 2 (1, 1). Processes – 2(1, 1). Targets – 2 (2, 0). Kite-mark (Award) – 1 (0, 1). To be the best – 2 (2, 0). Culture – 1 (0, 1). Survival - 1 (0, 1). There was some indication from this that the manufacturing/production organisations were more interested in costs and business results than those operating in the service sector. But further analysis of other texts showed how all of the above themes interconnected.

*Customer Orientation*. The case study organisations show evidence of a customer orientation through trying to achieve continuous improvement in the area of customer satisfaction. The BAA quotations above specifically connect the two themes. There is a change in emphasis over the period from understanding customer requirements to meeting customer requirements to exceeding customer require ments to providing extraordinary customer service to 'delighting and thrilling' customers. Recurrent keywords and phrases (with dates when first used where available) associated with programmes and activities include: Customer care (BA 1984, BT 1985); understand our customers (Rover 1986, BT 1987, RM 1988, BS 1992); customer satisfaction (BAe 1990, BP 1992), enhance customer satisfaction (BA 1993) exceptional customer satisfaction (BAe 1994); extraordinary customer satisfaction (Rover 1989): meeting customer requirements ((Rover 1986, BT 1987, BAA 1993, BAe 1994 ); exceeding customer expectations (RM 1995); customer focus (BA 1983, Rover 1989, BT 1988, RM 1990, BAA 1993, BS 1994); highest levels of customer service (BA 1987); excellence in customer service (BT 1990, BAe 1996); putting customers first (BA 1986, RM 1988, BT 1990, BS 1990); delighting customers (BAe 1996, BS 1996) ; DELIGHT and THRILL customers (BT 1992). );); inspire lifetime (customer) relationships ( Rover 1995)

*Employee Involvement / Participation / Teamwork*. They were a strong feature across the organisations often associated with continuous improvement. For example: *BT*: "We will make sure we understand and meet the requirements of our colleagues, to enable us to operate as an effective team" (1987) ; *Bae:* "We are dedicated to working together, and with our partners" (1995*); Rover*: "continuous improvement; total flexibility ... and participation in quality action teams "*; BA:* 'It All Depends On Me' – (Programme for ground staff 1987) 'Everyone makes a difference' (Marshall, CEO 1989); *BAA*: "CI needs staff involvement at every level" (1992); *BP* : "Openness, care, teamwork, empowerment and trust" (1990). *BS*: "I believe strongly that the growth of workforce participation in team activities is vital to maintain our progress towards Total Quality aimed at delighting the customer " [Vicars, MD Tinplate BS 1996]; *RM*: Employee participation via Continuous Improvement -1991-94. Our reputation depends on everyone making a contribution and becoming involved (1994).

*To be the Best.* Underpinning the notion of continuous improvement was a desire to *'be the best'* (BA 1983) or *'best in class'* (BP 1992) or to be a world-wide leader e.g. BTs aspiration "to become the most successful world-wide telecommunications group" (1990). BAA made a specific connection. "The route to a world class company is customer satisfaction, continuous improvement and committed people able to give of their best" (1995)

*Culture Shift.* Culture shift was seen as significant in all companies. *BT*: "We are committed to far reaching changes in our culture", [Graeme Odgers 1989]; *Bae*: "I want to create a British Aerospace culture ... we must benefit from learning from each other ... Our People Value underpins all that we do in our change programme" [Evans CEO 1996]; *Rover:* "What has really changed at Rover as a result of our total quality programme is the company culture", [Towers, CEO 1994[; *BA.* "To change the image of the company. To change the culture of the company. To increase profits" from the Putting Customer First initiative [1983]; *BP* "... we senior managers at BP want a nimble, new culture for our company. New culture - new behaviours and new motivation" [David Simon, senior executive 1990]; *BS*: Culture change through team-working [1994]; *RM:* "Since 1988 virtually all change in RM has been closely linked to the TQ approach" [Delafield 1993]. "Commitment to quality in all we do, striving to provide a service that at least meets our customers' requirements, has been central to our strategy. This has involved a transformation from being an inward, product-oriented organisation to an outward market-led and customer-focused one ... Our horizons need to expand still further, to establish new, more radical ways of looking at business strategy" [Cockburn 1993]

**Rhetorical Analysis of Terminology Used in the Case Study Organisations**

*Invention. Ethos;* Credibility of author or speaker –All of the statements listed emanate from CEOs or senior directors or are taken from company policy statements. *Pathos*; Appeal to emotion - The case study analysis threw up a number of rhetorical flourishes in each of the companies in question to support a commitment or ownership orientation. Examples include; Working with pride (Rover). Inspire lifetime relationships (Rover). We will foster pride and integrity in the organisation (BT) Every BT employee is an ambassador for the company. BA will have a corporate charisma such that everyone working for it will take pride in the company (1986 Mission statement). Our reputation depends on everyone making a contribution and becoming involved (RM). *Logos:* A range of logical arguments was drawn upon. There is a strong theme throughout the case studies about responding to competition "Times are tough. Competition is not just a bogeyman for us to frighten our people. It is very real and it is hurting" [BT Group Managing Director, 1992]. "To me the situation is close to crisis. Competition is really biting us, as competitors are hungry for BT share of the market" [MD, Development and procurement, 1992]. "To become the best airport in the world we must have the best people in the industry and equip them to compete effectively" [BAA Take Off 1996]. "All parts of the company are involved in programmes to increase productivity to ensure we are competitive" [Horton, CEO BP, 1990]. Responding to change is also a key theme. "It is not for us to inflict change, but for us to engage in a dialogue with our customers to determine their true needs and then to look at what we are doing and see if there is scope for change" [CEO RM, mid 1980s]. "We need to recognise change as a way of life as we enter the 1990s. We need to be prepared to manage actively the surprises of an uncertain, complex, volatile and rapidly changing world" [CEO BP Company Video 1990].

*Disposition.* Overall, the structure to achieve the aims is exhortative, sentences or clauses on many occasions prefaced by phrases such as 'we need to' or 'we must' or 'we want'. There is also a growing tendency towards hyperbole – it is not good enough to satisfy, we have to delight and thrill, be exceptional, be number one, be the best without any sense of irony. At a more technical level, where problem solving techniques are explained for example, there is frequent use of simple explanatory diagrams, to show how logical and obvious the approach is.

*Style.* There are an abundance of examples above of figurative language, which is the stylistic device most associated with rhetoric. "Our horizons need to expand still further" (RM); "competition is really biting us" (BT); ' "we want a nimble new culture" (BP); "the unwieldy telephonic dinosaur that came blinking into the light 10 years ago has evolved into a streamlined world class player" [BT 1994] - the list is endless. The words 'mission' and 'vision' featured throughout the study, are figures of speech, imported from a religious context.

*Memory.* Throughout the case study analysis, and implicit in many of the quotations above, were appeals to change based on reminding people of problems with the old, pre-privatised culture; its lack of responsiveness, its hierarchical nature, its inappropriateness to deal with new commercial demands such as competition and the need to retain customers. The ongoing swell of new programmes kept the perceived need for behavioural change in people's minds and enabled them to recall previous initiatives. Phrases were chosen to stick in the memory, many originating

from the quality gurus. Variants of 'Do it right first time' and 'zero defects' figured in seven of the case study organisation, ie. BP's 'Get it right first time and better the next' in 1996. Other interesting slogans were; 'vital few and useful many' (BT 1988); 'the 5 rights to do the right job' [BAe 1990]. Programme titles were chosen with great care: 'Putting People First' (BA); 'For all our tomorrow's' [BP 1989]; 'The New Deal programme' [Rover 1992]; 'Continuous Improvement' [BAA 1991].

*Delivery.* In addition, there were a series of strategies to reinforce messages by repetition through a range of media. High profile 'roadshows' run by CEOs, tapes, and videos buttressed the policy documents, line managers were trained in how to cascade the messages through their chain of command.

**Conclusions**

Over the period covered by the case study analysis 'continuous improvement' provided an overarching reference point for the TQPs in each of the organisations. The analytical framework outlined in figure 1 proved to be a valuable vehicle for comparing and contrasting the TQPs in the case study organisations from a continuous improvement perspective, but linked to the other TQM features incorporated. There was no significant evidence to differentiate between organisations on the basis of customer/process orientations, both of which were shared concerns. But throughout the period of study there was a focus on aspirational and inspirational vocabulary that led to a heightening of rhetorical imagery across all the organisations.

Table 1. *Summarises key terms against themes.*

| Objectives: Seeking excellence through continuous improvement in a changing and competitive world<br>Style : Aspirational and Inspirational<br>Mode: Communication through use of rhetorical devices | |
|---|---|
| **Customer Focus**<br>• Continuous service improvement,<br>• Exceed expectations<br>• Delight customers<br>• Customer satisfaction<br>• Inspire lifetime relationships<br>• Providing value / true value<br>• Customer is always right | **Process Focus**<br>• Continuous process improvement,<br>• Right 1st time Every time<br>• Zero defects<br>• 'get it right, check it is right',<br>• 'get it right first and better the next time'<br>• 'the way we want to do things' |
| **Competitive Focus**<br>• 'best' in class<br>• 'world' class<br>• Increasing our profits<br>• Benchmark<br>• Sustainable success | **Change Focus**<br>• Continuous Improvement<br>• Value and Innovation<br>• Creative thinking<br>• New behaviour, new motivation<br>• Change a way of life<br>• Transformation |

The language emanated from CEOs and other senior managers, supported by authoritative documents, videos and roadshows. The message was reinforced by a heavy investment in training. There is strong evidence that the case study organisations adopted an incremental 'transformational change' methodology. Steps (Nadler 1983, Kotter 1995) include establishing a sense of urgency of the need for change by examining market and competitive realities; creating a vision to help direct the change effort; communicating the vision throughout the organisation using every

vehicle possible; consolidating improvements and producing even more change. To persuade others of their position top management drew upon a range of rhetorical devices through a variety of communication modes.
There was abundant evidence of TQM rhetorical language being imported from the US and being added to. Did it get in the way of substance? The survey that accompanied this study indicated that 75% of those sampled were satisfied with the outcomes of the TQP initiatives. On the other hand, others complained of initiative overload, and two of the CEOs were dismissed over the period as they lost the support of their management team and staff.

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# An Analysis of Factors Associated With Research Productivity of Human Resource Development Faculty

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*This study describes the research productivity of HRD faculty, their perceptions of the organizational culture in their department to support research productivity, self-assessment of their research competency and anxiety. In general, little organizational culture and support for research exists in the institutions where the HRD faculty work. A regression analysis revealed that five variables explained 56% of the variance in research productivity: teaching, research, service, and administrative allocation, and the amount of graduate assistant hours.*

Keywords: Faculty Research Productivity, HRD Research Productivity, HRD Research

With the astounding growth of the HRD discipline over the past 20 years, and therefore of HRD programs throughout colleges and universities, some attention must be paid to the faculty members who are instructing those who will further develop the discipline of HRD. One such method of the development of a discipline is through the research produced by the faculty members within a discipline.

Research on research produced by HRD faculty is minimal. Williams (2000) referenced the lack of research in this arena that was in accordance with findings of Podsakoff & Dalton (1987) in closely related fields. Although there is a lack of research on HRD research, individuals within the HRD discipline have recognized the importance of research within their field by both producing a handbook on research to promote the link between research and practice, and by committing to increase publication efforts.

Research within the HRD discipline is also important as a conduit of thoughts and progress toward an understanding of phenomena within the discipline. In addition, research, along with teaching and service, is a required facet of all disciplines including HRD within colleges and universities. Promotion and tenure are commonly based on the quality and amount of publications produced. In addition, program quality is commonly judged by the productivity of is faculty members (DeMeuse, 1987).

Also, in higher education, faculty with a successful publishing record and expertise in research are often admired by other faculty and students as being on the cutting edge of their field and are regarded as knowledgeable about most issues in their field. McKeachie (1994) stated that research could provide individuals with a better background to be successful teachers. It can be said that these highly productive faculty members are seen as more powerful educators and often serve as a frame of reference for junior faculty members or others who are developing their own research agenda (Levine, 1997).

Due to the value and importance of research within HRD, it is necessary to determine the factors that are associated with HRD faculty research productivity. That is, what factors are related to increased research productivity?

## Theoretical/Conceptual Base

Research productivity and publications increased across academia throughout the 1990s (Sax, Astin, Korn, & Gilmartin, 1999). Specifically, within the HRD discipline, research publications have increased as evidenced by the

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increased number of journals and conference proceeding dedicated to the HRD discipline as well as the increased numbers of HRD academics publishing across HRD into related disciplines. However, even with this increase in publications, the number of such on the research itself – whether methodologies utilized or quantitative vs. qualitative studies or the needs of HRD – is quite limited. Throughout an extensive literature search, no publications were located specifically identifying factors associated with increased research publications and/or productivity within the HRD discipline. Due to the significant lack of study in this area, the factors chosen within this research effort to be investigated are based on research published on faculty research productivity in closely related fields of adult education, business education, agricultural education, and industrial/organizational psychology; therefore, these factors are purely exploratory in nature.

Several variables have been reported to relate to research productivity. Key variables which occur throughout related literature include personal variables (gender, age, confidence in research ability), personal variables associated with position (time allocation, rank, years of experience, salary, size of school), involvement with graduate student research (number of doctoral committees chaired, actively seeking research opportunities), and perceived institutional support (percent of graduate students as research assistants, increased salary, decreased teaching load, mobility, recognition).

Personal variables. Research provides mixed results concerning gender and research productivity. Liddle, Westergren, and Duke (1997) found no differences between gender types for research productivity, while Osadebe (1996) and Bailey (1992) reported a higher level of research productivity by male faculty members. Kahn (1997) and Vasil (1991) reported that males have higher self-efficacy perceptions towards research, and Vasil (1991) also reported that males spend more time performing research tasks than females. Other researchers have noted that female faculty members are lagging behind experienced male faculty members in research productivity (Gmlech, Wilke, & Lovrich, 1984; Smith, Anderson, & Lovrich, 1995; Sax et al., 1999). Blackburn, Bieber, Lawrence, & Trautvetter (1991) stated that the relationship between gender and research productivity had been addressed in many studies and that little if any, and sometimes contradictory, correlations have been found.

A second variable that is often associated with conflicting results is age. Bland and Berquist (1997) observed that the average productivity of faculty seems to drop with age, however, many senior faculty members remain quite active in research activities and their products are comparable to those of younger faculty members. They also reported that there is no significant evidence that age determines a drop in productivity, but increased workloads and shifting emphasis is to blame. Gorman and Scruggs (1984) reported that age was related to research productivity. While, Greer (1997) reported that active researchers are younger. Blackburn et al. (1991) stated that the relationship between age and research productivity had been addressed in many studies and that little if any, and sometimes contradictory, correlations have been found.

Attitude towards research has been shown to relate to research productivity. Faculty members' confidence in their research abilities is related to faculty research productivity. Schaupp (1994) reported that women with higher expectations predicted higher research productivity. Bean's (1982) model of faculty research productivity included the perceived level of legitimacy in one's research as an explanatory factor. Increases in ability and self-efficacy were also related to increased research productivity in studies conducted by Vasil (1992, 1996). Jones (1993) reported that individuals who perceived their research as a value were higher producers of research.

Variables Associated with the Organization. Numerous studies have suggested that how a faculty member spends his/her time may relate to productivity (Cohen & Gutek, 1991; Gmlech, et al., 1986; Vasil, 1992). This variable was investigated by Liddle et al. (1997) showing that a correlation between time spent in research, time spent advising, and total hours worked with productivity.

Bailey (1992) found that rank is a significant predictor of research productivity. Dundar and Lewis (1998) found that departments with higher ranked faculty had higher research productivity. Vasil reported that rank is a significant predictor of research productivity (1992).

Gorman and Scruggs (1984) and Vasil (1992) found that the number of years of professional employment was related to faculty productivity. Pfeffer and Langton (1993) reported that total years in the profession had a major impact on total research, but an insignificant effect on recent research productivity. Again, Blackburn et al. (1991) stated that the relationship between educational experience and research productivity had been addressed in many studies and that little if any, and sometimes contradictory, correlations have been found.

Several studies reported the relationship between research productivity and salary (Jacobsen, 1992; Pfeffer & Langton, 1993; Rebne, 1989; Tornquist & Kallsen, 1992). Since salary often reflects research productivity levels, this was expected. Paying attractive salaries in return for performance may serve as an incentive for higher productivity from faculty members. Higher salaries may also attract productive faculty while at the same time minimizing the possibility of losing active faculty to other institutions (Pfeffer & Langton, 1993).

Another factor related to faculty research productivity is the size of the institution in which the faculty member works. Behymer (1974) studied research productivity of faculty in four-year colleges and major research universities and reported that faculty in major research institutions publish more than faculty at smaller four-year colleges. This was similar to the findings by Bailey (1992) in which found a research productivity increases from Liberal Arts II Colleges through Research I Universities. Dundar and Lewis (1998), Gorman and Scruggs (1984), and Vasil (1992) also reported that institutional size was related to research productivity. However, Blackburn Bieber, Lawrence and Trautvetter (1991) reported that the characteristics of the employing institution were not related to research productivity.

Involvement with Graduate Student Research. In the area of terminal degree training, one key variable is the involvement of faculty with graduate student research. Kahan (1997) found that individuals in doctoral programs had higher research self-efficacy and self-efficacy was related to higher research productivity. This also supported by Daly (1995) that the practice setting and doctoral education is related to higher research productivity. The research-training environment does not only benefit the students. This is supported by Dundar and Lewis (1998) when they reported that high ratios of graduate students to faculty also correlates with productivity, and the percentage of graduate students that were hired as research assistants correlated highly with research production.

More directly, Kelly and Warmbrod (1986) found that the number of doctoral committees chaired successfully resulted in higher faculty research productivity. Gorman and Scruggs (1984) also reported that participation in graduate student research was related to faculty research productivity. The participation in graduate research and attitude of graduate students when exiting a doctoral program has also been shown to relate to research productivity. Kezmarsky (1989) reported that a favorable attitude towards research upon exiting a doctoral program and not research skills is positively related to research productivity. In a more specific study of vocational education faculty, Kelly (1982) found that actively seeking research opportunities during graduate school was identified with high producers of research.

Perceived institutional support. Kelly and Warmbrod (1986) stated that "Perceived institutional and departmental support for research are seen as the most important enablers to research productivity" (p. 31). Dundar and Lewis (1998) found that the percentage of graduate students hired as research assistants correlated highly with research production. Only one study could be found (Dundar and Lewis, 1998) that addressed faculty size. They reported that programs with smaller numbers of faculty cannot compete in the area of research productivity with larger universities.

Institutional support provided in the form of extrinsic rewards (money, reduced teaching load, tenure, mobility, recognition and promotion) was investigated by Butler and Cantrell (1989). Their study reported that depending on tenure status, various extrinsic rewards were valued higher as a motivator to increase productivity. For example, for non-tenured faculty, tenure was the most desirable reward, versus for tenured faculty, money and reduced teaching load were the most desirable rewards. This research may be indicative of variables which when present in organizations are viewed as that organization's support of increased productivity, and therefore, factors associated with productivity.

This study uses publication in refereed research journals as a surrogate for research productivity. This approach is supported by the literature. Radhakrishna and Jackson (1993) reported that publishing in refereed journals was ranked as the most important factor when agricultural and extension education department heads were asked to rank the importance of 13 factors in the evaluation of faculty. In a related study, Radhakrishna, Yoder and Scanlon (1994) concluded "Publications (refereed articles in journals and paper presentations in conferences) are considered to be a very important component of faculty productivity" (p. 17). This finding is supported by a comment made by William J. Cooper, former Dean of the [university name] Graduate School. Dean Cooper stated that "The only magic number is zero; if you haven't published in refereed journals, then publications in research conference proceedings, books and other publications are meaningless." (Personal Communication, August 1990). In Kelly and Warmbrod's study (1986), most of the variance (84.1%) in their research productivity score was explained by publications in refereed journals, with the remaining variance explained by seven other variables. The decision to use refereed journal articles as a surrogate for research productivity was based on the studies cited here.

**Purpose and Objectives**

This study sought to establish the factors that explain research productivity of HRD educators who serve as the faculty in colleges and universities. In this study, publications in refereed journals were used as a surrogate for research productivity. Specifically, the objectives of this study were to:

1. Describe selected demographic characteristics of the HRD faculty in the study.
2. Describe the research productivity of HRD faculty members.

3. Describe HRD faculty members' perceptions of the organizational culture that exists in their department to support research productivity.
4. Describe HRD faculty members' self-assessment of their research confidence.
5. Describe HRD faculty members' self-assessment of their research anxiety.
6. Determine if selected variables explain a significant proportion of the variance in the research productivity of HRD faculty.

**Research Methods and Procedures**

The population for this study included all full-time, professorial rank faculty employed by colleges and universities in the United States that are Academy of Human Resource Development (AHRD) members. The frame for the study was from the AHRD membership list. Using Cochran's (1977) sample size formula and adjusting for a 50% return rate, a random sample of 264 faculty members was selected.

*Instrumentation*

The scales and items used in the instrument were selected after a review of the literature and grounded in the theoretical base of the study. The face and content validity of the instrument was evaluated by an expert panel of university faculty and doctoral level graduate students in human resource education. The instrument was pilot tested with 20 university faculty members. Changes recommended by the validation panel, when appropriate, and those identified as needed during the pilot test, were incorporated into the instrument. These changes occurred in the wording of items, the design of scales, and in the instructions for completing the instrument. Internal consistency coefficients for the scales in the instrument were calculated using Cronbach's *alpha* and were as follows: organizational culture/support for research scale - a =.88, faculty self-assessment of research confidence - a= .88, and faculty self-assessment of research anxiety - a =.79.

*Data Collection*

The responses were collected using two mailings and a systematic follow-up of a random sample of non-respondents. Each mailing consisted of a questionnaire, cover letter, and stamped addressed return envelope. A response rate of 24.2% (64 out of 264) was attained after completion of the two mailings and the telephone follow-up.

*Data Analyses*

The data were analyzed using descriptive statistics for objectives one through five. Backward multiple regression analysis was used for objective six. The alpha level was set á priori at .05. To determine if the sample was representative of the population and to control for non-response error, the scale means for the three primary scales and the primary variable of measure research productivity were considered to be the primary variables in the study and the scale means were compared by response mode (mail versus phone follow-up) as recommended by Borg (1987) and Miller and Smith (1983). There were no statistically significant differences between the means by response mode for the three primary scales in the instrument: Organizational Culture/Support for Research Scale - $t$=.54, $p$=.59, $df$=62, Faculty Self-Assessment of Research Confidence Scale - $t$=.73, $p$=.47, $df$=62, Faculty Self-Assessment of Research Anxiety – $t$=1.86, $p$ =.07, $df$=62. In addition, there were no statistically significant difference between the means by response mode for the number of single ($t$=1.83, $p$=.07, $df$=62), coauthored lead ($t$=.18, $p$=.86, $df$=62), and coauthored not lead ($t$=.73, $p$=.47, $df$=62). It was concluded that no differences existed by response mode, and the data were representative of the population. The mail and phone follow-up responses were combined for further analysis.

**Findings**

The following sections review this study's findings.

*Research Objective 1: Demographic Characteristics of Faculty*

This research objective sought to describe selected demographic characteristics of the faculty in the study. Most of the HRD education faculty was male (35 or 54.7%). The mean age of those reporting was 51.16 years (SD=9.37). The mean salary of those who responded to this question ($n$ = 48), with adjusting for nine-month contract, was $59,380 (SD= $24,050), with most holding a 9-month contract (41 or 64.1%). Of those responding, 20.3% (n=13)

were full professors, 39.1% (n=25) were associate professors, 35.9% (n=23) were assistant professors, and 3.1% (n=2) were instructors.

The participants reported their universities allocated an average of 47.9% of their time for teaching, 25.7% of their time for conducting research, 14.6% of their time for service duties, and 11.0% amount of their time for administrative duties. Many (n=47, 73.4%) had earned the doctorate. The number of doctoral students advised to completion in the past five years ranged from 0 to 50 with an average of 6.7 completions (SD=12.4), while the number of masters students advised to completion in the last five years ranged from 0 to 55 with an average of 7.8 students advised to completion (SD=13.3).

*Research Objective 2: Faculty Research Productivity*

In this study, articles published in refereed journals in the past five years were used as a surrogate for research productivity. Those surveyed reported that, in the past five years, they had published an average of 3.17 (SD=5.60) refereed journal articles for which they were the sole author, an average of 2.92 (SD=5.20) co-authored refereed journal articles for which they were the lead author, and 2.22 (SD=2.79) co-authored refereed journal articles for which they were not the lead author. The range of publication was from 0 to 33 for single authored publications, 0 to 36 in co-authored publications being the lead author, and 0 to 17 for co-authored publications not being the lead author. Of the respondents in the last five years, 32.8% (n=21) did not publish a single authored article, 29.7% (n=19) did not publish a co-authored article being lead, and 23.4% (n=15) did not publish a co-authored article not in the lead. Overall 10.9% (n=7) of the respondents did not publish in any category over the last five years.

For the purposes of this study, total research productivity was calculated as follows: the respondent was given a credit of 1.0 for each article published for which they were the sole author, a credit of .50 for each co-authored article published for which they were the lead author, and a credit of .33 for each co-authored article published for which they were not the lead author. The mean faculty research productivity score was 5.37 (SD=7.23).

*Research Objective 3: Organizational Culture.*

The Organizational Culture/Support for Research (OCSR) Scale contained 20 items that assessed the faculty members' perceptions of the organizational culture and support for research that existed in their department. Responses were recorded on a five point Likert scale that ranged from 1=Strongly Disagree to 5=Strongly Agree. The scale grand mean was 2.62 (SD=.66).

*Research Objective 4: Self-Assessment of Research Confidence.*

The fourth research objective sought to describe the faculty members' self-assessment of their research confidence as measured by the Faculty Self-Assessment of Research Confidence Scale that consisted of 7 items. The overall mean for the scale was 3.90 (SD=.81).

*Research Objective 5: Self-Assessment of Research Anxiety*

The fifth research objective sought to describe the faculty members' self-assessment of their research anxiety as measured by the Faculty Self-Assessment of Research Anxiety Scale that consisted of 9 items. The overall mean for the scale was 2.41 (SD=.66).

*Research Objective 6: Explanation of Variance in Research Productivity by Selected Variables.*

The last research objective sought to determine if selected variables explain a significant proportion of the variance in research productivity. A backward multiple regression procedure was used to examine the amount of variance in research productivity explained by selected variables. The procedure revealed that five variables within a significant (p=.018) model to explain 56% of the variance found in research productivity ($R^2$=.564). These variables included teaching percentage (p=.002), research percentage (p=.002), service percentage (p=.002), administrative percentage (p=.002), and hours of graduate assistant support per week (p=.009). The variables that did not explain a significant proportion of the variance were number of masters students advised to completion, work hours, age, gender, rank, adjusted salary, organizational culture/support for research scale mean, self-assessment of research confidence scale mean, self-assessment of research anxiety scale mean, number of doctoral students advised to completion, total years in a tenure-track position, teaching at a land grant university, hours of undergraduate support per week, and research and publishing in terminal degree program.

**Conclusions**

With the majority of HRD faculty publishing articles – whether single or co-authored – over the past five years, and with only a minimal number of faculty not publishing at all, production of research is an area which HRD faculty are making a concerted effort to develop. The mean research productivity score also demonstrates the value of research production to HRD faculty. HRD faculty's perception of organizational culture/support for research is however not supportive of increased research productivity. This leads to the recommendation that some intrinsic reward system may be influencing the HRD faculty to produce research.

The HRD faculty members are somewhat confident in their ability to conduct research with the faculty being most confident in determining a research methodology. Along with confidence, HRD faculty demonstrated they are only a little anxious when producing research and have the least difficulty in reviewing articles for refereed research journals. This may further support the level of research productivity of HRD faculty demonstrated within this research effort.

In attempting to explain HRD faculty research productivity, the division of time of an HRD faculty member's duties (teaching, research, service and administrative) and the number of graduate assistant hours of support per week are driving factors for HRD research productivity within this study. Due to the lack of previous research on HRD faculty, comparisons with other studies cannot be made, and therefore, it is recommended that further research be conducted to determine the validity of these results. However, the factors presented here as the most contributory to research productivity are logical in nature, and the further investigation of these factors demonstrated that as one increases duties across each of these areas, their research productivity decreases. These factors could potentially be correlated with other factors such as total work hours or family situation to provide a clearer picture of the results.

**Implications on HRD Research**

Overall, this research study provides a basis for HRD university departments to review the perceptions of HRD faculty members concerning their organizational culture and support, and to consider the allocation of a professor's time when desiring certain research productivity levels from such individuals. This study also demonstrates the apparent dedication to the production of research with the HRD discipline that is most beneficial as the discipline continues to develop and strive to define itself more clearly. Lastly, this study strives to create a mental model of the relevance in conducting research on research in the HRD discipline to aid in the further development of the discipline.

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